AT&T TECHNICAL JOURNAL • A JOURNAL OF THE AT&T COMPANIES

AT&T TECHNICAL JOURNAL

1987 INDEX AND CONTENTS

VOLUME 66

EDITORIAL BOARD

S. HORING, *Chairman*
AT&T Bell Laboratories

M. COCCA, *Secretary* • AT&T Bell Laboratories
P. K. BOHACEK • AT&T Network Systems
W. S. BROWN • AT&T Corporate Headquarters
H. O. BURTON • AT&T Data Systems
J. CHERNAK • AT&T Bell Laboratories
M. I. COHEN • AT&T Engineering Research Center
B. R. DARNALL • AT&T Bell Laboratories
J. J. DEGAN, Jr. • AT&T Bell Laboratories
A. FEINER • AT&T Communications Systems
A. G. FRASER • AT&T Bell Laboratories
U. F. GIANOLA • AT&T Bell Laboratories
K. G. INGRAM • AT&T Network Planning
G. R. JOHNSON • AT&T Business Markets
W. H. KASTNING • AT&T Technology Systems
V. NARAYANAMURTI • Sandia National Laboratories
N. W. NILSON • AT&T Components & Electronic Systems
T. L. POWERS • AT&T Bell Laboratories
D. SHEINBEIN • AT&T Bell Laboratories

EDITORIAL STAFF

D. L. RAYMOND, *Editorial Director*
A. B. MYERS, *Editor*
D. K. FARMER, *Associate Editor*
R. T. ULLRICH, *Associate Editor*
G. F. WATSON, *Associate Editor*
I. J. JONES, *Art Director*
G. A. WALLACE, *Circulation Manager*

Copyright© 1988 AT&T

VOLUME 66

	Page
Index	1
Contents	10

No. 1, January/February	Lightwave Technology
No. 2, March/April	General
No. 3, May June ..	Technology for Network Services
No. 4, July/August	Interconnection Technology
No. 5, September/October	Product Realization
No. 6, November/December	General

AT&T TECHNICAL JOURNAL (ISSN 8576-2324)
is published six times a year by AT&T. Individual subscriptions: U.S.—1 year $40; 2 years $72; 3 years $94; Foreign—1 year $50; 2 years $82; 3 years $104.

Payment for foreign subscriptions must be made in U.S. funds, or by check drawn on a U.S. bank, and made payable to the *AT&T Technical Journal*, and sent to AT&T Bell Laboratories, Circulation Dept., Room 1K-424, 101 J. F. Kennedy Pkwy, Short Hills, NJ 07078.

Current or recent issues may be obtained by writing to our Circulation Dept. at the address shown above, or by calling (201) 564-2582. You may obtain back issues from the AT&T Customer Information Center, P.O. Box 19901, Indianapolis, IN 46219, or by calling (800) 432-6600. From outside the U.S. call (317) 352-8557. Photocopy or microform reprints from the *Journal* are available by writing to University Microfilms International, 300 N. Zeeb Road, Ann Arbor, MI 48106, or calling (800) 521-0600. From outside the U.S. call (313) 761-4700.

Copyright© 1988 AT&T, 550 Madison Avenue, New York, NY 10022; R. E. Allen, Chairman of the Board; L. L. Christensen, Secretary. Printed in U.S.A.

Index to Volume 66

A

Acampora, A. S., **66-6** (1987), 21-34
Access Charge and Revenue Architecture, **66-3** (1987), 73-81
Access network termination chip (basic) for ISDN 4-wire loops, **66-6** (1987), 35-50
Advanced services quick implementation capability *See* ASQIC
Advances in Lightwave Systems Research, **66-1** (1987), 5-18
Algorithms (center-tap tracking) for timing recovery, **66-6** (1987), 63-78
Ambeker, S. M., **66-4** (1987), 81-95
Analog Voice Privacy System (The), **66-1** (1987), 119-131
Analysis
  and design of ideal arbiters, **66-2** (1987), 78-96
  (performance) and application of a two-priority packet queue, **66-3** (1987), 82-99
Anderson, J. M., **66-1** (1987), 45-64
Application and performance analysis of a two-priority packet queue, **66-3** (1987), 82-99
Applications
  of lightwave technology and systems, **66-1** (1987), 5-18
  of photonic switching technology, **66-3** (1987), 41-53
Arbiters (ideal; analysis and design), **66-2** (1987), 78-96
Architecture
  access charge and revenue, **66-3** (1987), 73-81
  evolution (AT&T network), **66-3** (1987), 2-12
Architecture for Factory Control Automation (An), **66-5** (1987), 77-85
ASQIC 800 Call Data Master, **66-3** (1987), 21-31
AT&T
  common channel signaling networks **66-3** (1987), 13-20
  network and service capabilities (new; operations system technology) **66-3** (1987), 64-72
AT&T Network Architecture Evolution, **66-3** (1987), 2-12
AT&T's Pay-per-View Television Trial, **66-3** (1987), 54-63
Automatic speaker recognition (vector quantization approach to), **66-2** (1987), 14-26
Automation (factory control; architecture for), **66-5** (1987), 77-85
AVPS *See* Analog voice privacy system

B

Bartels Lax, B. J., **66-5** (1987), 21-38
Basic Access Network Termination Chip for ISDN 4-Wire Loops, **66-6** (1987), 35-50
Bauer, K. B., **66-1** (1987), 119-131
Bernet, Y., **66-6** (1987), 3-14
Biffle, J. H., **66-6** (1987), 51-62
Bill processing (use of access charge and revenue architecture for), **66-3** (1987), 73-81
Bock, D. E., **66-1** (1987), 119-131
Boundaries of lightwave technology (extending the), **66-1** (1987), 2-4
Boza, L. B., **66-5** (1987), 2-4
Bradley, J. F., **66-2** (1987), 70-77
Braunstein, M. R., **66-3** (1987), 21-31
BRPS *See* Business resources planning system
Buffer utilization and delay-throughput characteristics of some statistical multiplexers, **66-2** (1987), 55-69
Bulfer, A. F., **66-3** (1987), 54-63
Burchett, S. N., **66-6** (1987), 51-62
Burling, W. A., **66-5** (1987), 21-38
Burton, C. L., **66-3** (1987), 21-31
Business applications of 630 multitasking graphics terminal, **66-6** (1987), 3-14
Business problem caused by divestiture (design of access charge and revenue system to solve), **66-3** (1987), 73-81
Business Resources Planning System (The), **66-5** (1987), 49-60

C

CAD *See* Computer-aided design
CAE *See* Computer-aided engineering
CAE/CAD tools for interconnection technology, **66-4** (1987), 57-59
Call data master (ASQIC 800), **66-3** (1987), 21-31
Campbell, R. L., **66-5** (1987), 77-85
Carrier sense multiple access protocol with collision detection (multiplexer access scheme), **66-2**

(1987), 66-59
CCS *See* Common channel signaling
CDM *See* Call data master
Center-Tap Tracking Algorithms for Timing Recovery, **66-6** (1987), 63-78
Channel signaling (common) network evolution, **66-3** (1987), 13-20
Chip
(basic access network termination) for ISDN 4-wire loops, **66-6** (1987), 35-50
(network-interface) for ISDN terminals, **66-2** (1987), 27-39
Cohen, H. M., **66-4** (1987), 70-80
Cohen, L. G., **66-1** (1987), 19-32
Cohen, M. I., **66-4** (1987), 2-12
Coherent lightwave transmission, **66-1** (1987), 5-18
Cole, T. E., **66-4** (1987), 81-95
Common Channel Signaling Network Evolution, **66-3** (1987), 13-20
Communication/interconnection performance (improved; future technological directions for), **66-4** (1987), 13-30
Complex electronic and electromechanical assemblies (nonlinear structural analysis of), **66-6** (1987), 51-62
Computer-aided design (CAD), for interconnection technology, **66-4** (1987), 57-69
Computer-aided engineering (CAE), for interconnection technology, **66-4** (1987), 57-69
Computer-Aided Engineering and Design for Interconnection Technology, **66-4** (1987), 57-69
Computer aids for product design and introduction support systems, **66-5** (1987), 21-38
Computer-based systems (AT&T) for product design and manufacturing, **66-5** (1987), 3-85
Computerized information systems to support manufacturing functions for AT&T's factories (PRISM), **66-5** (1987), 61-76
Conjugate gradient method solution technique for nonlinear structural problems, **66-6** (1987), 51-62
Connector and splicing technology (lightwave), **66-1** (1987), 45-64
Control automation architecture (factory), **66-5** (1987), 77-85
Cox, R. V., **66-6** (1987), 119-131
Criteria for evaluating project development, **66-2** (1987), 40-49
CSMA/CD *See* Carrier sense multiple access protocol with collision detection
Cummings, J. L., **66-3** (1987), 2-12
Customer (JC Penny) trial of 800 call data master, **66-3** (1987), 21-31
Customer reliability requirements (AT&T designs to satisfy), **66-4** (1987), 70-80

D

Data links and interfaces (lightwave), **66-1** (1987), 65-72
DDM-1000 lightwave multiplexer for loop applications, **66-1** (1987), 108-118
Delay-Throughput and Buffer Utilization Characteristics of Some Statistical Multiplexers, **66-2** (1987), 55-69
Depressed cladding single-mode fiber, **66-1** (1987), 19-32
Design and analysis of ideal arbiters, **66-2** (1987), 78-96
Design and engineering for interconnection technology (computer-aided), **66-4** (1987), 57-69
Design and performance of single-mode lightguide cables, **66-1** (1987), 84-94
Design quality review (software), **66-2** (1987), 40-49
Digitized graphic images (PICO, interactive editor for), **66-2** (1987), 2-13
Dishman, J. M., **66-4** (1987), 57-69
Dispersion, single-mode fiber, **66-1** (1987), 19-32
Dixon, R. W., **66-1** (1987), 73-83
DQR *See* Design quality review
Dual Versus Triplication Reliability Estimations, **66-6** (1987), 15-20
Dutta, N. K., **66-1** (1987), 73-83

E

Editor for digitized graphic images (PICO), **66-2** (1987), 2-13
Effective Number of Keys in a Voice Privacy System Based on Permutation Scrambling, **66-1** (1987), 132-136
Effects of Increased Subscriber-Line Charge on Total Surplus and GNP, **66-5** (1987), 86-91
Ehlers, M. L., **66-5** (1987), 49-60
800 call data master (ASQIC), **66-3** (1987), 21-31
Electronic and electromechanical assemblies (complex; nonlinear structural analysis of), **66-6** (1987), 51-62
Engineering and design for interconnection technology (computer-aided), **66-4** (1987), 57-69
Estimations (reliability; dual versus triplication), **66-6** (1987), 15-20
Evaluation (reliability) of interconnection products, **66-4**

(1987), 70-80
Evolution
of AT&T network architecture, **66-3** (1987), 2-12
of common channel signaling network, **66-3** (1987), 13-20
Evolution of Gigabit Lightwave Transmission Systems, **66-3** (1987), 32-40
Extending the Boundaries of Lightwave Technology, **66-1** (1987), 2-4

F

Factory control automation (architecture for), **66-5** (1987), 77-85
Fallah, H., **66-2** (1987), 40-49
Fastech® integrated packaging system, **66-4** (1987), 81-95
Fiber
drawing process, **66-1** (1987), 33-34
optical, manufacturing techniques, **66-1** (1987), 33-44
single-mode, **66-1** (1987), 19-32,84-94
Fiber-optic
data links, **66-1** (1987), 65-72
rotors, **66-2** (1987), 70-77
Firmware enhancement of 630 multitasking graphics terminal, **66-6** (1987), 3-14
4-wire loops (ISDN; basic access network termination chip for), **66-6** (1987), 35-50
Franks, R. L., **66-5** (1987), 61-76
Franzon, P., **66-4** (1987), 13-30
Frey, D. R., **66-1** (1987), 45-64
Functional and performance requirements in factory control automation (architectural considerations for), **66-5** (1987), 77-85
Fundamental Interconnection Issues, **66-4** (1987), 13-30
Future technological directions for improved interconnection/communication performance, **66-4** (1987), 13-30

G

Gartside, C. H., III, **66-1** (1987), 84-94
Gashier, R. J., **66-4** (1987), 31-44
Giffels, C. A., **66-4** (1987), 31-44
Gigabit lightwave transmission systems (evolution of), **66-3** (1987), 32-40
Gitlin, R. D., **66-6** (1987), 63-78
GNP *See* Gross National Product
and total surplus, effects of increased subscriber-line charge on, **66-5** (1987), 86-91
Govind, P. K., **66-2** (1987), 27-39; **66-6** (1987), 35-40
Graphics terminal (630 multitasking), **66-6** (1987), 3-14
Gray, J. C., **66-5** (1987), 49-60
Gross National Product (GNP), effects of increased subscriber-line charge on, **66-5** (1987), 86-91
Gundaker, B. F., **66-5** (1987), 5-20

H

Hamilton, W. E., **66-4** (1987), 81-95
Hardware enhancements of multitasking graphics terminal, **66-6** (1987), 3-14
Harrod, W. L., **66-4** (1987), 2-12
Hatamian, M., **66-4** (1987), 13-30
Hickey, K. R., **66-3** (1987), 2-12
Hinton, H. S., **66-3** (1987), 41-53
Hluchyj, M. G., **66-6** (1987), 21-34
Holtman, J. P., **66-5** (1987), 61-76
Holzmann, G. J., **66-2** (1987), 2-13
Hoover, C. W., Jr., **66-4** (1987), 2-12
Hornak, L. A., **66-4** (1987), 13-30
Hsu, J. L. C., **66-5** (1987), 61-76

I

Ideal Arbiters: Analysis and Design, **66-2** (1987), 78-96
Identifying promising new point-of-presence locations for local serving offices, **66-2** (1987), 50-54
Identifying software and procedural solutions (business resources planning system criteria for), **66-5** (1987), 49-60
Image transformation techniques (use of PICO to test), **66-2** (1987), 2-13
Improvement systems (productivity) for manufacturing, **66-5** (1987), 61-76
Improving the Performance of an Integrated Circuit Manufacturing Line, **66-5** (1987), 39-48
Increased subscriber-line charge (effects on total surplus and GNP), **66-5** (1987), 86-91
Integrated circuit
for access to ISDN terminals, **66-2** (1987), 27-39
manufacturing line (improving the performance of), **66-5** (1987), 39-48
Integrated Services Digital Network *See* ISDN
Interactive editor for digitized graphic images (PICO), **66-2** (1987), 2-13
Interconnection
issues (fundamental), **66-4** (1987), 13-30

levels (traditional; from IC chip packages to frames), **66-4** (1987), 45-56
products (reliability evaluation of), **66-4** (1987), 70-80
systems used in electronic system packaging, **66-4** (1987), 31-44
system requirements and modeling, **66-4** (1987), 44-56
Interconnection/communication performance (improved; future technological directions for), **66-4** (1987), 13-30
Interconnection Media, **66-4** (1987), 31-44
Interconnection System Requirements and Modeling, **66-4** (1987), 45-56
Interconnection technology
Computer Aided Engineering and Design for Interconnection Technology, **66-4** (1987), 57-69
Fundamental Interconnection Issues, **66-4** (1987), 13-30
Interconnection Media, **66-4** (1987), 31-44
Interconnection System Requirements and Modeling, **66-4** (1987), 45-56
Reliability Evaluation of Interconnection Products, **66-4** (1987), 70-80
Systems Packaging, **66-4** (1987), 81-95
Technology of Interconnection (The), **66-4** (1987), 2-12
Interdepartmental access charge and revenue systems architecture to solve business problem after divestiture, **66-3** (1987), 73-81
Interdisciplinary team approach to improve performance of an integrated circuit manufacturing line, **66-5** (1987), 39-48
Interfaces
and data links (lightwave), **66-1** (1987), 65-72
rotating (optical rotors), **66-2** (1987), 70-77
Integrated Services Digital Network (ISDN)
4-wire loops (basic access network termination chip for), **66-6** (1987), 35-50
terminals (network-interface chip for), **66-2** (1987), 27-39
Introduction support systems and product design, **66-5** (1987), 21-38
ISDN *See* Integrated Services Digital Network

J

Jablonowski, D. P., **66-1** (1987), 33-44
JAC and JAC3D computer programs for solving nonlinear quasi-static response of solids, **66-6** (1987), 51-62
Jayant, N. S., **66-1** (1987), 132-136
Johnston, J. D., **66-1** (1987), 119-131
Juang, B.-H., **66-2** (1987), 14-26

K

Kalish, D., **66-1** (1987), 19-32
Karim, M. R., **66-2** (1987), 55-69
Karol, M. J. **66-6** (1987), 21-35
Keys (effective number of) in a voice privacy system based on permutation scrambling, **66-1** (1987), 132-136
Kinney, B. D., **66-3** (1987), 2-12
Klafter, L., **66-2** (1987), 70-77
Knausenberger, W. H., **66-4** (1987), 45-56

L

Lavin, J. S., **66-2** (1987), 50-54
Lawser, J. J., **66-3** (1987), 13-20
Lax, Bartels, B. J., **66-5** (1987), 21-38
LED technology (advances in), **66-1** (1987), 73-83
Li, T., **66-1** (1987), 5-18
Light-emitting diode *See* LED
Lightguide Applications in the Loop, **66-1** (1987), 108-118
Lightguide cables (single-mode; design and performance of), **66-1** (1987), 84-94
Lightwave
communication, **66-1** (1987), 2-118
history of, **66-1** (1987), 95-107
networks, terabit, multihop approach, **66-6** (1987), 21-34
transmission across rotating interfaces (optical rotors), **66-2** (1987), 70-77
transmission system, gigabit, evolution of, **66-3** (1987), 32-40
Lightwave Data Links and Interfaces, **66-1** (1987), 65-72
Lightwave Device Technology, **66-1** (1987), 73-83
Lightwave Splicing and Connector Technology, **66-1** (1987), 45-64
Lightwave systems
gigabit, **66-3** (1987), 32-40
research (advances in), **66-1** (1987), 5-18
terrestrial, **66-1** (1987), 95-107
Lightwave technology
Advances in Lightwave Systems Research, **66-1** (1987), 5-18
(extending the boundaries of), **66-1** (1987), 2-4
Lightguide Applications in the Loop, **66-1** (1987),

108-118
Lightwave Data Links and Interfaces, **66-1** (1987), 65-72
Lightwave Device Technology, **66-1** (1987), 73-83
Lightwave Splicing and Connector Technology, **66-1** (1987), 45-64
Optical Fiber Manufacturing Techniques, **66-1** (1987), 33-44
Single-Mode Cable for Long-Haul, Trunk, and Loop Networks, **66-1** (1987), 84-94
Single-Mode Fiber: From Research and Development to Manufacturing, **66-1** (1987), 19-32
Terrestrial Lightwave Systems, **66-1** (1987), 95-107
Lightwave transmission
across rotating interfaces (optical rotors), **66-2** (1987), 70-77
system, gigabit, evolution of, **66-3** (1987), 32-40
Linhart, P. B., **66-5** (1987), 86-91
Little, T. E., **66-4** (1987), 13-30
Local serving offices (optimally rehoming to a new point of presence), **66-2** (1987), 50-54
Lo, C.-Y., **66-3** (1987), 82-99
Logic devices (application of photonic switching to), **66-3** (1987), 41-53
Long-haul, metropolitan interoffice, and subscriber loop systems (single-mode lightwave for), **66-1** (1987), 19-32
Long-haul, trunk, and loop networks (single-mode cable for), **66-1** (1987), 84-94
Loop, lightguide applications in the, **66-1** (1987), 108-118
Loop, long-haul, and trunk networks (single-mode cable for), **66-1** (1987), 84-94
Loops (ISDN 4-wire; basic access network termination chip for), **66-6** (1987), 45-50
LuValle, M. J., **66-4** (1987), 70-80
Lynch, J. F., **66-2** (1987), 70-77

M

Manufacture and distribution of AT&T products (business resources planning system for), **66-5** (1987), 49-60
Manufacturing
functions (architecture for automation of), **66-5** (1987), 77-85
line (integrated circuit; improving performance of), **66-5** (1987), 39-48
productivity improvement systems for, **66-5** (1987), 61-76
resource planning (business resource planning system model focus on), **66-5** (1987), 49-60
Market tests of new AT&T service concepts (ASQIC program for), **66-3** (1987), 21-31
Martinich, D. E., **66-5** (1987), 5-20
McCarthy, J. M., **66-6** (1987), 3-14
McNabb, S. D., **66-3** (1987), 21-31
Meadors, H. C., Jr., **66-6** (1987), 63-78
Mean time to failure *See* MTTF
Media used for interconnections, **66-4** (1987), 31-44
Merski, R., **66-3** (1987), 64-72
Methods and tools for reliability evaluation of interconnection products, **66-4** (1987), 70-80
Metrobus lightwave transmission system, **66-1** (1987), 95-107
Metropolitan interoffice, long-haul, and subscriber loop systems (single-model lightwave technology for), **66-1** (1987), 19-32
Military lightwave uses (optical rotors for), **66-2** (1987), 70-77
Miller, C. M., **66-1** (1987), 45-64
Mitchell, J. P., **66-4** (1987), 70-80
Modeling and system requirements (interconnection), **66-4** (1987), 45-56
Morabito, J. M., **66-4** (1987), 31-44
MTG *See* Multitasking graphics terminal
MTTF calculation for triple modular redundance system, **66-6** (1987), 15-20
Multihop approach for terabit lightwave networks, **66-6** (1987), 21-34
Multiplexers (statistical; delay-throughput and buffer utilization characteristics of some), **66-2** (1987), 55-69
Multitasking graphics terminal (630) **66-6** (1987), 3-14
Multiuser communications network (multihop approach for terabit lightwave networks to improve), **66-6** (1987), 21-34

N

Nantz, T. D., **66-1** (1987), 108-118
Network
and service capabilities (new AT&T; operations systems technology for) **66-3** (1987), 64-72
architecture evolution (AT&T), **66-3** (1987), 2-12
evolution (common channel signaling), **66-3** (1987), 13-20
operations systems technology for) **66-3** (1987), 64-72
Network-Interface Chip for ISDN Terminals (A), **66-2** (1987), 27-39

Network services technology
Access Charge and Revenue Architecture, **66-3** (1987), 73-81
ASQIC 800 Call Data Master, **66-3** (1987), 21-31
AT&T Network Architecture Evolution, **66-3** (1987), 2-12
AT&T's Pay-per-View Television Trial, **66-3** (1987), 54-63
Common Channel Signaling Network Evolution, **66-3** (1987), 13-20
Evolution of Gigabit Lightwave Transmission Systems, **66-3** (1987), 32-40
Operations Systems Technology for New AT&T Network and Service Capabilities, **66-3** (1987), 64-72
Photonic Switching Technology Applications, **66-3** (1987), 41-53
Network termination chip (basic access) for ISDN 4-wire loops, **66-6** (1987), 35-50
Networks
(long-haul, trunk, and loop; single-mode cable for), **66-1** (1987), 84-94
(terabit lightwave; multihop approach), **66-6** (1987), 21-34
Neve, J. M., **66-5** (1987), 39-48
New AT&T network and service capabilities (operations systems technology for), **66-3** (1987), 64-72
New point of presence (optimally rehoming local serving offices to), **66-2** (1987), 50-54
Nonlinear Structural Analysis of Complex Electronic and Electromechanical Assemblies, **66-6** (1987), 61-62
Number of keys in a voice privacy system based on permutation scrambling (effective), **66-1** (1987), 132-136

O

Obuchowski, E. J., **66-3** (1987), 73-81
Offord, G. E., **66-2** (1987), 27-39
Oikonomou, K. N., **66-2** (1987), 78-96
O'Neill, L. A., **66-5** (1987), 21-38
One-way addressable cable systems for pay-per-view television, **66-3** (1987), 54-63
Operations Systems Technology for New AT&T Network and Service Capabilities, **66-3** (1987), 64-72
Optical
communication, **66-1** (1987), 2-118
data links, **66-1** (1987), 65-72
fiber cable, single-mode, manufacture of, **66-1** (1987), 84-94
fibers, splicing and connectors for, **66-1** (1987), 33-44
Optical Fiber Manufacturing Techniques, **66-1** (1987), 33-44
Optical Rotors—Lightwave Transmission Across Rotating Interfaces, **66-2** (1987), 70-77
Optimally Rehoming Local Serving Offices to a New Point of Presence, **66-2** (1987), 50-54
Origin of interconnection technology, **66-4** (1987), 2-12
Overview
of interconnection technology, **66-4** (1987), 2-12
product realization systems, **66-5** (1987), 3-4
Oxley, P. L., **66-3** (1987), 13-20

P

Packaging of an electronic system, **66-4** (1987), 81-95
Packet queue (two-priority, nonpreemptive; performance analysis and application of), **66-3** (1987), 82-99
Paek, U. C., **66-1** (1987), 33-44
Panuska, A. J., **66-1** (1987), 84-94
Parikh, N. D., **66-6** (1987), 35-50
Parrish, D. M., **66-3** (1987), 64-72
Patel, P. D., **66-1** (1987), 84-94
Pay-per-view television trial (AT&T's), **66-3** (1987), 54-63
Pennino, T. P., **66-5** (1987), 21-38
Performance
and design of single-mode lightguide cables, **66-1** (1987), 84-94
and functional requirements in factory control automation (architectural considerations for), **66-5** (1987), 77-85
integrated-circuit manufacturing line, **66-5** (1987), 39-48
Performance Analysis and Application of a Two-Priority Packet Queue, **66-3** (1987), 82-99
Permutation scrambling (effective number of keys in a voice privacy system based on), **66-1** (1987), 132-136
Photodetector technology (advances in), **66-1** (1987), 73-83
Photonic Switching Technology Applications, **66-3** (1987), 41-53
PICO—A Picture Editor, **66-2** (1987), 2-13
Picture composition *See* PICO
Pinnel, M. R., **66-4** (1987), 45-56
Piper, L. J., **66-2** (1987), 27-39
Planning system (business resources), **66-5** (1987), 49-60
Point of presence (new; optimally rehoming local serving

offices to), **66-2** (1987), 50-54
Point-to-point multiplexer access scheme, **66-2** (1987), 55-69
Polarization-preserving single-mode fiber, **66-1** (1987), 19-32
POP *See* Point of presence
Powers, T. L., **66-5** (1987), 3-4
Priority (two) packet queue (performance analysis and application of), **66-3** (1987), 82-99
PRISM *See* Productivity improvement systems for manufacturing
Procedures for design quality reviews, **66-2** (1987), 21-38
Product Design and Introduction Support Systems, **66-5** (1987),
Product design and manufacturing (AT&T computer-based systems for), **66-5** (1987), 3-85
Product realization
Architecture for Factory Control Automation (An), **66-5** (1987), 77-85
Business Resources Planning System (The), **66-5** (1987), 49-60
Improving the Performance of an Integrated Circuit Manufacturing Line, **66-5** (1987), 39-48
Product Design and Introduction Support Systems, **66-5** (1987), 21-38
Product Realization Systems, **66-5** (1987), 3-4
Productivity Improvement Systems for Manufacturing, **66-5** (1987), 61-76
Quality Technology in Product Realization Systems, **66-5** (1987), 5-20
Product Realization Systems, **66-5** (1987), 3-4
Productivity Improvement Systems for Manufacturing, **66-5** (1987), 61-76

Q

QC Toolkit for statistical quality control, **66-5** (1987), 5-20
Quality management tasks, **66-5** (1987), 5-20
Quality review (software design), **66-2** (1987), 40-49
Quality Technology in Product Realization Systems, **66-5** (1987), 5-20
Quantization (vector) approach to speaker recognition, **66-2** (1987), 14-26
Queue (two-priority packet; performance analysis and application of), **66-3** (1987), 82-99

R

Rabiner, L. R., **66-2** (1987), 14-26
Radner, R., **66-5** (1987), 86-91
Ray, F. D., **66-5** (1987), 39-48
Raymer, L. G., **66-5** (1987), 61-76
Rehoming local serving offices to a new point of presence (optimally), **66-2** (1987), 50-54
Relational devices (application of photonic switching to), **66-3** (1987), 41-53
Reliability estimations (dual versus triplication), **66-6** (1987), 15-20
Reliability Evaluation of Interconnection Products, **66-4** (1987), 70-80
Research/development to manufacturing of single-mode fiber, **66-1** (1987), 19-32
Revenue management (use of access charge and revenue architecture for), **66-3** (1987), 73-81
Rogalski, J. E., **66-3** (1987), 32-40
Rosenberg, A. E., **66-2** (1987), 14-26
Rosenthal, C. W., **66-4** (1987), 57-69
Rotors (optical; lightwave transmission across rotating interfaces), **66-2** (1987), 70-77

S

Sanferrare, R. J., **66-1** (1987), 95-107
Semiconductor laser technology (advances in), **66-1** (1987), 73-83
Service and network capabilities (new AT&T; operations systems technology for) **66-3** (1987), 64-72
Shenk, W. J., **66-1** (1987), 108-118
Shipboard lightwave cable systems (optical rotors for), **66-2** (1987), 70-77
Shi, Y. C., **66-2** (1987), 70-77
Signaling (common channel) network evolution, **66-3** (1987), 13-20
Single-Mode Cable for Long-Haul, Trunk, and Loop Networks, **66-1** (1987), 84-94
Single-Mode Fiber: From Research and Development to Manufacturing, **66-1** (1987), 19-32
Sitarik, J. P., **66-5** (1987), 39-48
630 Multitasking Graphics Terminal (The), **66-6** (1987), 3-14
SLC® Series 5 carrier system for loop applications, **66-1** (1987), 108-118
Snyder, B. E., **66-5** (1987), 61-76
Snyder, J. H., **66-1** (1987), 119-131
Software Design Quality Review (The), **66-2** (1987), 40-49
Soong, F. K., **66-2** (1987), 14-26
Speech recognition (vector quantization approach to), **66-2** (1987), 14-26

Splicing and connector technology (lightwave), **66-1** (1987), 45-64
Sproles, E. S., Jr., **66-4** (1987), 70-80
Statistical multiplexers (delay-throughput and buffer utilization characteristics of some), **66-2** (1987), 55-69
Striny, K. M., **66-4** (1987), 31-44
Structural analysis (nonlinear) of complex electronic and electromechanical assemblies, **66-6** (1987), 51-62
Subscriber-line charge (increased; effects on total surplus and GNP), **66-5** (1987), 86-91
Subscriber loop, long-haul and metropolitan interoffice systems (single-mode lightwave technology for), **66-1** (1987), 19-32
SUPER (software-based quality management tool), **66-5** (1987), 5-20
Support systems (introduction) and product design, **66-5** (1987), 21-38
Switching technology applications (photonic), **66-3** (1987), 41-53
System requirements and modeling (interconnection), **66-4** (1987), 45-56
Systems Packaging, **66-4** (1987), 81-95
Systems technology (operations) for new AT&T network and service capabilities, **66-3** (1987), 64-72
System Used for Prediction and Evaluation of Reliability *See* SUPER

T

Technology for network services
Access Charge and Revenue Architecture, **66-3** (1987), 73-81
ASQIC 800 Call Data Master, **66-3** (1987), 21-31
AT&T Network Architecture Evolution, **66-3** (1987), 2-12
AT&T's Pay-per-View Television Trial **66-3** (1987), 54-63
Common Channel Signaling Network Evolution, **66-3** (1987), 13-20
Evolution of Gigabit Lightwave Transmission Systems, **66-3** (1987), 32-40
Operations Systems Technology for New AT&T Network and Service Capabilities, **66-3** (1987), 64-72
Photonic Switching Technology Applications, **66-3** (1987), 41-53
Technology (interconnection)
Computer-Aided Engineering and Design for Interconnection Technology, **66-4** (1987), 57-69
Fundamental Interconnection Issues, **66-4** (1987), 13-30
Interconnection Media, **66-4** (1987), 31-44
Reliability Evaluation of Interconnection Products, **66-4** (1987), 70-80
Systems Packaging, **66-4** (1987), 81-95
Technology of Interconnection (The), **66-4** (1987), 2-12
Technology (lightwave)
Advances in Lightwave Systems Research, **66-1** (1987), 5-18
(extending the boundaries of), **66-1** (1987), 2-4
Lightguide Applications in the Loop, **66-1** (1987), 108-118
Lightwave Data Links and Interfaces, **66-1** (1987), 65-72
Lightwave Device Technology, **66-1** (1987), 73-83
Lightwave Splicing and Connector Technology, **66-1** (1987), 45-64
Optical Fiber Manufacturing Techniques, **66-1** (1987), 33-44
Single-Mode Cable for Long-Haul, Trunk, and Loop Networks, **66-1** (1987), 84-94
Single-Mode Fiber: From Research and Development to Manufacturing, **66-1** (1987), 19-32
Terrestrial Lightwave Systems, **66-1** (1987), 95-107
Technology of Interconnection (The), **66-4** (1987), 2-12
Technology (operations systems) for new AT&T network and service capabilities, **66-3** (1987), 64-72
Telecommunications switching (application of photonic technology to), **66-3** (1987), 41-53
Telemarketing (630 multitasking graphics terminal used for), **66-6** (1987), 3-14
Television trial (AT&T's pay-per-view), **66-3** (1987), 54-63
Terabit Lightwave Networks: The Multihop Approach, **66-6** (1987), 21-34
Terminal
network-interface chip for, **66-2** (1987), 27-39
630 multitasking graphics, **66-6** (1987), 3-14
Termination chip (basic access network) for ISDN 4-wire loops, **66-6** (1987), 35-50
Terrestrial Lightwave Systems, **66-1** (1987), 95-107
Testing, Operations, Provisioning, Administration System (TOPAS), application of operations system technology in, **66-3** (1987), 64-72
Tewksbury, S. K., **66-4** (1987), 13-31
Text-independent speaker recognition system, **66-2**

(1987), 14-26
Thomas, D. G., **66-1** (1987), 2-4
Timing recovery (center-tap tracking algorithms for), **66-6** (1987), 63-78
TMAS *See* Transport Maintenance Administration System
TMR *See* Triple modular redundancy
Tools and methods for reliability evaluation of interconnection products, **66-4** (1987), 70-80
TOPAS *See* Testing, Operations, Provisioning, Administration System
Tortorella, M. J., **66-5** (1987), 5-20
Total surplus and GNP (effects of increased subscriber-line charge on), **66-5** (1987), 86-91
Toy, W. M., **66-6** (1987), 15-20
Tracking algorithms (center-tap) for timing recovery, **66-6** (1987), 63-78
Transmission (lightwave) across rotating interfaces (optical rotors), **66-2** (1987), 70-77
Transmission systems (gigabit lightwave; evolution of), **66-3** (1987), 32-40
Transport Maintenance Administration System (TMAS), application of operations system technology in, **66-3** (1987), 64-72
Triple modular redundancy system (MTTF calculation for), **66-6** (1987), 15-20
Trunk, long-haul, and loop networks (single-mode cable for), **66-1** (1987), 84-94
T7252 UNIX® system chip (network termination for ISDN 4-wire loops), **66-6** (1987), 35-50
Tucker, G. T., **66-2** (1987), 40-49
Two-priority packet queue (performance analysis and application of), **66-3** (1987), 82-99

U

UNITE™ integrated circuit, **66-2** (1987), 27-39
UNITS *See* user to network interface termination for switched (network)
Usage-sensitive pricing system for television entertainment, **66-3** (1987), 54-63
User to network interface termination for switched (UNITS) network, chip T7252 (network termination for ISDN 4-wire loops), **66-6** (1987), 35-50

V

Vector Quantization Approach to Speaker Recognition (A), **66-2** (1987), 14-26
Voice privacy system
(analog), **66-1** (1987), 119-131
based on permutation scrambling (effective number of keys in), **66-1** (1987), 132-136
Voice recognition (vector quantization approach to), **66-2** (1987), 14-26
Voice scrambler, AVPS, **66-1** (1987), 119-131
VQ *See also* Vector quantization
codebook for speaker recognition, **66-2** (1987), 14-26

W

Watkins, L. S., **66-1** (1987), 33-44
Wave-division-multiplexing strategy in lightwave transmission system development, **66-3** (1987), 32-40
Welsh, F. S., **66-1** (1987), 65-72
Windhuasen, R. A., **66-6** (1987), 35-50

1987 CONTENTS

January/February

LIGHTWAVE TECHNOLOGY

Extending the Boundaries of Lightwave Technology 2
D. G. Thomas

Advances in Lightwave Systems Research 5
T. Li

Single-Mode Fiber: From Research and Development to Manufacturing 19
D. Kalish and L. G. Cohen

Optical Fiber Manufacturing Techniques 33
D. P. Jablonowski, U.-C. Paek, and L. S. Watkins

Lightwave Splicing and Connector Technology 45
J. M. Anderson, D. R. Frey, and C. M. Miller

Lightwave Data Links and Interfaces 65
F. S. Welsh

Lightwave Device Technology 73
R. W. Dixon and N. K. Dutta

Single-Mode Cable for Long-Haul, Trunk, and Loop Networks 84
C. H. Gartside, III, A. J. Panuska, and P. D. Patel

Terrestrial Lightwave Systems 95
R. J. Sanferrare

Lightguide Applications in the Loop 108
T. D. Nantz and W. J. Shenk

The Analog Voice Privacy System 119
R. V. Cox, D. E. Bock, K. B. Bauer, J. D. Johnston, and J. H. Snyder

Effective Number of Keys in a Voice Privacy System Based on Permutation Scrambling 132
N. S. Jayant

March/April

PICO—A Picture Editor 2
G. J. Holzmann

A Vector Quantization Approach to Speaker Recognition 16
F. K. Soong, A. E. Rosenberg, B.-H. Juang, and L. R. Rabiner

A Network-Interface Chip for ISDN Terminals 28
P. K. Govind, G. E. Offord, and L. J. Piper

The Software Design Quality Review 42
H. Fallah and G. E. Tucker

Optimally Rehoming Local Serving Offices to a New Point of Presence 52
J. S. Lavin

Delay-Throughput and Buffer Utilization Characteristics of Some Statistical Multiplexers 57
M. R. Karim

Optical Rotors—Lightwave Transmission Across Rotating Interfaces 72
Y. C. Shi, L. Klafter, J. F. Bradley, and J. F. Lynch

Ideal Arbiters: Analysis and Design 80
K. N. Oikonomou

May/June

TECHNOLOGY FOR NETWORK SERVICES

AT&T Network Architecture Evolution 2
J. L. Cummings, K. R. Hickey, and B. D. Kinney

Common Channel Signaling Network Evolution 13
J. J. Lawser and P. L. Oxley

ASQIC 800 Call Data Master 21
M. R. Braunstein, C. L. Burton, and S. D. McNabb

Evolution of Gigabit Lightwave Transmission Systems 32
J. E. Rogalski

Photonic Switching Technology Applications 41
H. Scott Hinton

AT&T's Pay-Per-View Television Trial 54
A. F. Bulfer

Operations Systems Technology for New AT&T Network and Service Capabilities 64
R. Merski and D. M. Parrish

Access Charge and Revenue Architecture 73
E. J. Obuchowski

Performance Analysis and Application of a Two-Priority Packet Queue 82
C.-Y. Lo

July/August

INTERCONNECTION TECHNOLOGY

The Technology of Interconnection 2
C. W. Hoover, Jr., W. L. Harrod, and M. I. Cohen

Fundamental Interconnection Issues 13
M. Hatamian, L. A. Hornak, T. E. Little, S. K. Tewksbury, and P. Franzon

Interconnection Media 31
C. A. Giffels, R. J. Gashler, J. M. Morabito, and K. M. Striny

Interconnection System Requirements and Modeling 45
M. R. Pinnel and W. H. Knausenberger

Computer-Aided Engineering and Design for Interconnection Technology 57
Charles W. Rosenthal and J. M. Dishman

Reliability Evaluation of Interconnection Products 70
H. M. Cohen, M. J. Luvalle, J. P. Mitchell, and E. S. Sproles, Jr.

Systems Packaging 81
S. M. Ambekar, W. E. Hamilton, and T. E. Cole

September/October

PRODUCT REALIZATION

Product Realization Systems 3
L. B. Boza and T. L. Powers

Quality Technology in Product Realization Systems 5
B. F. Gundaker, D. E. Martinich, and M. J. Tortorella

Product Design and Introduction Support Systems 21
W. A. Burling, B. J. Bartels Lax, L. A. O'Neill, and T. P. Pennino

Improving the Performance of an Integrated Circuit Manufacturing Line 39
J. M. Neve, F. D. Ray, and J. P. Sitarik

The Business Resources Planning System 49
J. C. Gray and M. L. Ehlers

Productivity Improvement Systems for Manufacturing 61
R. L. Franks, J. P. Holtman, J. L. C. Hsu, L. G. Raymer, and B. E. Snyder

An Architecture for Factory Control Automation 77
R. L. Campbell

Effects of Increased Subscriber-Line Charge on Total Surplus and GNP 86
P. B. Linhart and R. Radner

November/December

The 630 Multitasking Graphics Terminal 3
Y. Bernet and J. M. McCarthy

Dual Versus Triplication Reliability Estimations 15
W. N. Toy

Terabit Lightwave Networks: The Multihop Approach 21
A. S. Acampora,
M. J. Karol, and M. G. Hluchyj

Basic Access Network Termination Chip for ISDN 4-Wire Loops 35
R. A. Windhausen, N. D. Parikh, and P. K. Govind

Nonlinear Structural Analysis of Complex Electronic and Electromechanical Assemblies 51
J. H. Biffle and S. N. Burchett

Center-Tap Tracking Algorithms for Timing Recovery 63
R. D. Gitlin and H. C. Meadors, Jr.